March 29, 2004

Ms. Kate Schalk
Conference Management Group
ERG
110 Hartwell Avenue
Lexington, MA 02421-3126

Re: Asbestos as a Surrogate for Determining Risk from Other WTC Related Contaminants

Dear Ms. Schalk:

The EPA, Region 2, *WTC Residential Confirmation Cleaning Study* (May 2003) concluded that "*conducting asbestos air sampling was a conservative method for determining if additional cleaning was needed*." Accordingly, this letter offers my opinions regarding the following three questions presented to World Trade Center Peer Review Consultants:

- In the manner used by EPA, is the selection of asbestos as a surrogate for determining risk from other WTC-related contaminants supported?

- Do other contaminants that were measured in the *Residential Confirmation Cleaning Study* provide equally good or better surrogates for determining risk from other contaminants?

- Do the reviewers know of any other contaminants associated with the World Trade Center that were not included in the COPC document or the Confirmation Cleaning Study that may serve as a surrogate for determining the risk from other contaminants?

Question #1: Is selection of asbestos as surrogate for determining risk from other WTC-related contaminants supported?

WTC-related dust consists of a unique mixture of synthetic vitreous fibers, mineral components of concrete and cement, mineral components of building wallboard, glass shards, asbestos, heavy metals, and high temperature combustion products.[1,2,3] Analysis of confidential data for a single building showed that levels of contaminants (such as

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1 Chatfield, EJ and Kominsky, JR. Summary Report: *Characterization of Particulate Found in Apartments After Destruction of the World Trade Center* (October 12, 2001).

2 EPA, Region 2, Database of Environmental Sampling Results (Bulk and Settled Dust Samples).

3 Lioy, JL et al. *Dust: A Metric for Use in Residential and Building Exposure Assessment and Source Characterization.* Environ. Health Persp. 110: 969-983, 2002.

asbestos, lead, and other contaminants) in WTC dust are generally proportional to each other and to the measured surface dust concentration. In addition to the linear correspondence, it was noticed that for a given dust concentration the variability of a contaminant concentration was between one and two orders of magnitude. Most likely, this is because the levels of different contaminants are not intrinsically dependent on each other, and because the dust samples from which the measurements were taken were different. Although it is likely that the same conclusion would be realized for the apartments involved in the *Residential Confirmation Cleaning Study*, it is recommended that a similar analysis be performed on the pre-cleaning surface data from the cleaning study and the EPA Region 2 Database of Environmental Sampling Results, as necessary. This analysis could include preparation of log-log scatter plots of the contamination data versus measured dust concentration. *The aforementioned data analyses strongly support the selection of asbestos as a surrogate for determining risk from other WTC-related contaminants.*

The use of asbestos as a surrogate or marker for recontamination of the previously cleaned apartments allows for a quantitative determination of risk to the occupants, but also enables effective comparability of the *Residential Confirmation Cleaning Study* database with the planned resampling data sets. The resuspension and buoyancy characteristics of asbestos fibers further support its selection as a surrogate.[4]

The use of asbestos as a risk surrogate is predicated on the premise that surficial contamination will be resuspended via intentional air disturbance; i.e., aggressive or modified-aggressive air sampling, as applicable. Therefore, it is of paramount importance that the resampling protocol includes specific direction to ensure that any residual material in "hidden or not readily accessible areas" be sufficiently disturbed and re-entrained in the air stream of the apartment. These areas can be identified using the concept of "*Best Engineering Judgement*."[5]

Analysis of settled and bulk dusts in apartments contaminated with WTC dust showed that the asbestos was consistently serpentine (chrysotile); no amphiboles were identified.[1] Accordingly, I agree with Greg Meeker's comments:[6] *"For chrysotile, the finest fibers are below the resolution limit of optical techniques, but it is these finest fibers that are most likely to be re-suspended and be present after initial cleaning. …TEM is the only appropriate technique for analysis of asbestos in this situation"* to ensure confidence in the analysis.

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4 Heath Effects Institute-Asbestos Research (HEI-AR). *Asbestos in Public and Commercial Buildings*, Chapter 4.5.3 " *Secondary Releases to the Building Environment*" (1991).

5 Seiler, FA, Davis, HT, Kominsky, JR, et al. *Use of Risk Assessment Methods in the Certification of Decontaminated Buildings.* Risk Analysis, Vol. 7, No.4: 487-495 (1987).

6 G. Meeker (USGS Denver Microbeam Laboratory). Comments on Draft to Peer Review from G. Meeker.

Question #2: Do other contaminants that were measured in the Residential Confirmation Cleaning Study provide equally good or better surrogates for determining risk from other contaminants?

As noted above for asbestos, analysis of confidential data showed that levels of contaminants including lead in WTC dust are generally proportional to each other and to the measured surface dust concentration. Accordingly, lead would be a reasonable supplemental surrogate to using asbestos. However, the use of lead or any other metal with only a limited subset of sample analyses from the *Residential Confirmation Cleaning Study* cannot address the question of recontamination, but could present data on "existing contamination" or "presence of WTC dust."

Question #3: Any other contaminants associated with the World Trade Center that were not included in the COPC document or the Confirmation Cleaning Study that may serve as a surrogate for determining the risk from other contaminants?

No.

Thank you for the opportunity to participate in the WTC Peer Review Consultants Panel. Should you have any questions regarding these opinions or require supplemental information, please contact me at (513) 742.7216 or ***jkominsky@eqm.com*** (e-mail).

Respectfully submitted,

ENVIRONMENTAL QUALITY MANAGEMENT, INC.

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